Rainier Commons Building 10 and 11
Dust Sample Collection and Assessment Plan

11-10-14

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NVL Project No.	**2012-494**
Site Address:	**Rainier Commons** 3100 Airport Way S, Seattle, 98134

Introduction

NVL Laboratories, Inc. (NVL) has prepared this sampling plan to comply with The EPA Requirements for House Dust Sample Collection and Assessment and to establish procedures ensuring the quality of the sample collection, analysis, interpretation and reporting for dust samples to be collected from identified units at Rainier Commons located in Buildings 10 and 11 as requested by and in coordination with EPA. Further references to this plan herein will be under the following underlined title: Dust Sample Collection and Assessment Plan.

Overall, the intention of this Dust Sample Collection and Assessment Plan is to provide a sampling plan meeting requirements provided by the EPA.

Rainier Commons will utilize the data gathered pursuant to this sampling plan, in consultation with NVL and in conjunction with EPA to assess the work associated with the Work Plan, IPWP for Phase I and related amendments and to verify that no further action is required on the interior of these units and that there is no unreasonable risk of injury to human health and the environment.

References

The following lists the references used in connection with this Sampling Plan. References are referred to in this document using the underlined titles.

- Work Plan = “Work” or “Plan” = Rainier Commons Work Plan Dated March 25, 2013 / Revised July 25, 2013
- IPWP = Individual Phased Work Plan Dated April 3, 2014
- Associated IPWP amendments
- Ecology & Environment Site Specific Sampling Plan- Rainier Commons PCB, Ecology and Environment, Inc., June 4, 2010

- Quality Assurance Project Plan for Rainier Commons House Dust Sample Collection and Assessment, USEPA November 2014

Summary of EPA Requirements for this Dust Sample Collection and Assessment Plan

The following summarizes what has been communicated by the EPA to include in our sampling requirements:

- Samples to be collected for EPA Risk Assessment: PCB wipe samples collect via hexane wipes; wipe samples for blasting media metals collect via ghost wipes; bulk dust samples for PCBs and blasting media metals collect via nilfisk vacuum.

- Date and time for Sample Collection: Commencing November 12, 2014 at 9:00 a.m. Plan 30 minutes to one hour per unit. Sampling is currently planned to occur in units 10-400, 10-300, 10-200, 11-200. EPA may add additional units.

- Sample Locations: EPA provided a document which shows the location for each sample to be collected. The floor plans with the sample locations are included in the table below for reference. At each of the blue dots a hexane wipe, a ghost wipe and a bulk dust sample will be collected. A total of 21 areas are identified for sampling. Two dots are shown at each window as the window sill will be sampled as well as the floor area underneath the sill. Only one dot is shown in 11-200 because the window sill(s) are not thought to be exposed. It is believed that a sound proof wall is located in front of the sill(s). If the sill(s) are exposed, then a sample will be collected from each, along with another sample from the floor below the sill.

- Number of Samples Planned: 21 hexane wipes, 21 ghost wipes and 21 bulk dust vacuum samples. In addition, if the sill and corresponding floor area in 11-200 are configured in a manner that calls for sampling, one additional sample of each above stated type will be collected. In addition, for quality assurance and quality control, we will collect one additional sample for each 10 hexane wipe samples and one additional sample per each ghost wipe sample collected. Bulk dust vacuum samples will not require duplicate sample collections, per EPA. Laboratory blanks will also be run pursuant to laboratory QA/QC protocols.

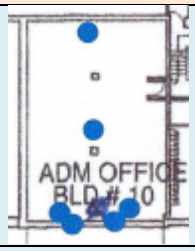
- Hexane Wipe Samples for PCBs: Will be collected using gauze and hexane solution. Samples will be collected at the windowsill, the floor below the window, from a horizontal surface in the middle of the room, and a horizontal surface at the back of the room. Along with QA samples as referenced above, one for every 10 wipe samples. Wipes will be collected over 10 cm by 10 cm area. Action level for reporting will be 10 ug/wipe. Method Reporting Limit will be .050ug/wipe.

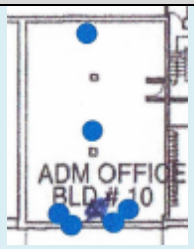
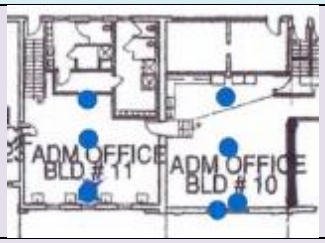
Locations for Testing

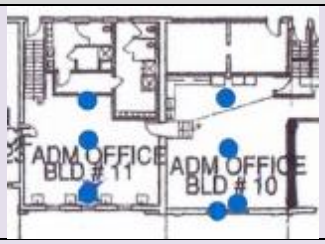
The locations for testing identified will comply with the EPA requirements for this Dust Sample Collection and Assessment Plan.

The following table summarizes the locations, sample types and number of samples:

Unit	EPA Identified Locations on Floor Plan	Type of Samples	Location Description	Size of Area to be Sampled**	Number of Samples
10-400		**Wipe Samples for PCBs**	Windowsill	100 cm^2	1
10-400	See Floor Plan Above	"	At the floor at the window	100 cm^2	1
10-400	See Floor Plan Above	"	At a horizontal surface in the middle of the room	100 cm^2	1
10-400	See Floor Plan Above	"	At a horizontal surface at the back of the room	100 cm^2	1
10-400	Not Applicable*	"	QA samples. (field blank)	N/A	1
10-400	See Floor Plan Above	**Wipe Samples for Metals**	Windowsill	1 ft^2	1
10-400	See Floor Plan Above	"	At the floor at the window	1 ft^2	1
10-400	See Floor Plan Above	"	At a horizontal surface in the middle of the room	1 ft^2	1
10-400	See Floor Plan Above	"	At a horizontal surface at the back of the room	1 ft^2	1
10-400	Not Applicable*	"	QA samples. (field blank)	N/A	1

Unit	EPA Identified Locations on Floor Plan	Type of Samples	Location Description	Size of Area to be Sampled**	Number of Samples
10-400		**Vacuum Sampling for Collection of Bulk Dust for PCB analysis**	Windowsill	.25 m^2	1
10-400	See Floor Plan Above	"	At the floor at the window	.25 m^2	1
10-400	See Floor Plan Above	"	At a horizontal surface in the middle of the room	.25 m^2	1
10-400	See Floor Plan Above	"	At a horizontal surface at the back of the room	.25 m^2	1
10-300		**Wipe Samples for PCBs**	Windowsill	100 cm^2	1
10-300	See Floor Plan Above	"	At the floor at the window	100 cm^2	1
10 -300	See Floor Plan Above	"	At a horizontal surface in the middle of the room	100 cm^2	1
10-300	See Floor Plan Above	"	At a horizontal surface at the back of the room	100 cm^2	1
10-300	Not Applicable*	"	QA samples. (field blank)	N/A	1
10-300	See Floor Plan Above	**Wipe Samples for Metals**	Windowsill	1 ft^2	1
10-300	See Floor Plan Above	"	At the floor at the window	1 ft^2	1
10-300	See Floor Plan Above	"	At a horizontal surface in the middle of the room	1 ft^2	1
10-300	Not Applicable*	"	At a horizontal surface at the back of the room	1 ft^2	1
10-300	See Floor Plan Above	"	QA samples. (field blank)	N/A	1

Unit	EPA Identified Locations on Floor Plan	Type of Samples	Location Description	Size of Area to be Sampled**	Number of Samples
10-300		**Vacuum Sampling for Collection of Bulk Dust for PCB analysis**	Windowsill	.25 m^2	1
10-300	See Floor Plan Above	"	At the floor at the window	.25 m^2	1
10-300	See Floor Plan Above	"	At a horizontal surface in the middle of the room	.25 m^2	1
10-300	See Floor Plan Above	"	At a horizontal surface at the back of the room	.25 m^2	1
10-200 & 11-200		**Wipe Samples for PCBs**	Windowsill	100 cm^2	1
10-200 & 11-200	See Floor Plan Above	"	At the floor at the window	100 cm^2	1
10-200 & 11-200	See Floor Plan Above	"	At a horizontal surface in the middle of the room	100 cm^2	1
10-200 & 11-200	See Floor Plan Above	"	At a horizontal surface at the back of the room	100 cm^2	1
10-200 & 11-200	Not Applicable*	"	QA samples. (field blank)	N/A	1

Unit	EPA Identified Locations on Floor Plan	Type of Samples	Location Description	Size of Area to be Sampled**	Number of Samples
10-200 & 11-200		**Wipe Samples for Metals**	Windowsill	1 ft^2	1
10-200 & 11-200	See Floor Plan Above	"	At the floor at the window	1 ft^2	1
10-200 & 11-200	See Floor Plan Above	"	At a horizontal surface in the middle of the room	1 ft^2	1
10-200 & 11-200	See Floor Plan Above	"	At a horizontal surface at the back of the room	1 ft^2	1
10-200 & 11-200	Not Applicable*	"	QA samples. (field blank)	N/A	1
10-200 & 11-200	See Floor Plan Above	**Vacuum Sampling for Collection of Bulk Dust for PCB analysis**	Windowsill	.25 m^2	1
10-200 & 11-200	See Floor Plan Above	"	At the floor at the window	.25 m^2	1
10-200 & 11-200	See Floor Plan Above	"	At a horizontal surface in the middle of the room	.25 m^2	1
10-200 & 11-200	See Floor Plan Above	"	At a horizontal surface at the back of the room	.25 m^2	1

*Note: Field blank samples corresponding to each sample are to be processed inside the sample area in a manner consistent with the Quality Assurance Project Plan for Rainier Commons Dust Sample Collection and Assessment

**For Bulk Dust Vacuum Samples, sample area is to increased by increments of .25 m^2 until minimum sample weight is met as per Quality Assurance Project Plan for Rainier Commons House Dust Sample Collection and Assessment

Sampling Methodology

A Certified Industrial Hygienist (CIH) will oversee all sample collection, analysis, data interpretation and reporting involved with this Dust Sample Collection and Assessment Plan.

Wipe Samples for PCBs

- Surface samples for the presence of Polychlorinated Biphenyls (PCBs) will be collected using a wiping technique with 2 inch square cotton gauze pads wetted with n-hexane which will be previously prepared by NVL at their laboratory location in separate clean glass vials.
- Sample collection methodology will follow the steps described in EPA's Quality Assurance Project Plan for Rainier Commons House Dust Sample Collection and Assessment pages 17 and 18 Titled: Wipe Sample Collection for Characterization of Dust and Residue Concentrations.
- Surface areas sampled will be measured using a disposable 100 square centimeter (100 cm^2) paper template. One template will be used per sample collected and then disposed.
- Clean nitrile gloves will be used by the sampler at each location and will be appropriately collected for disposal and replaced at each new location.
- All sample locations will be identified, reviewed and confirmed with Rainier Commons and EPA personal on site prior to sample collection.

Wipe Samples for Metals

- Surface samples for the presence of metals in the blasting media (Chromium, Copper, Nickel and Zinc) will be collected using a wiping technique using *Ghost Wipes*.
- Sample collection methodology will follow the steps described in EPA's Quality Assurance Project Plan for Rainier Commons House Dust Sample Collection and Assessment pages 17 and 18 Titled: Wipe Sample Collection for Characterization of Dust and Residue Concentrations. The only difference is that Ghost Wipes will be used rather than 2 inch square cotton gauze pads wetted with n-hexane.
- Surface areas sampled will be measured using a disposable half square foot (.5 ft^2) paper template. One template will be used per each sample collected and then disposed. A total of two areas will be sampled for a total of 1 ft^2.
- Clean nitrile gloves will be used by the sampler at each location and will be appropriately collected for disposal and replaced at each new location.
- All sample locations will be identified, reviewed and confirmed with Rainier Commons and EPA personal on site prior to sample collection.

Vacuum Sampling for Collection of Bulk Dust for PCB analysis

The EPA Quality Assurance Project Plan for Rainier Commons House Dust Sample Collection and Assessment identifies a procedure commonly referred in recent conversations with the EPA as "Nilfisk vacuuming for bulk dust" that entails using a pre-weighed sample collection sock over the end of the metal tube of a Nilfisk brand HEPA vacuum cleaner Model Number UZ 940. The procedure includes multiple steps to prepare the specific brand and model of vacuum, including needing to clean hoses, curved plastic tubes and upholstery nozzles with soap and water, tap water rinse and solvent rinse with ethyl alcohol.

Given that the intent of the vacuum sampling procedure is to collect a bulk sample of settled dust on a surface for laboratory analysis, the following alternate procedure is provided as a substitute.

The identified advantages and reasons for the alternate procedure include:

- The identified Action Level is not dependent on using a pre-weighed collection sock. Rather it is dependent on being able to weigh the dust that is actually analyzed.
- The procedure identifies a specific Brand and Model of vacuum that is not easily obtained. The vacuum is no longer in production and neither NVL nor Rainier Commons owns the specific brand or model.
- The size and scale of the proposed sampling equipment is appropriate for the surfaces being tested. The Nilfisk vacuum identified is more appropriate to extract dust samples out of upholstery. Also, the original purpose of the identified Nilfisk sampling procedure was for studies being done on cleanliness of homes using a bulk weight of dust, not for detecting potential low content of PCBs or metals in small quantities of settled dust.
- The alternate procedure greatly increases Quality Assurance by removing the risk of compromising or contaminating a sample due to the multiple cleaning steps to assure quality control. Rather it uses new materials once and removes the need for cleaning equipment. Tubing that is used for sample collection will be used only once, then replaced with new when another sample is collected.
- The alternate procedure will minimize sample loss. The use of an enclosed cassette rather than a collection sock will minimize loss of any material collected as the sample due to filter efficiency and handling of the filter sock in the field and in the laboratory. The current plan does not identify the filter efficiency of the pre-weighed collection sock. With the alternate procedure, the filter efficiency is known by the selected filter that will be used.

The alternate procedure will be as follows:

The pattern or technique of dust collection from a surface will be the same as detailed in EPA's Quality Assurance Project Plan for Rainier Commons House Dust Sample Collection and Assessment. The exception to this will be the use of different collection equipment in place of the Nilfisk brand vacuum and pre-weighed collection sock, for the practical and quality assurance reasons outlined above.

The following equipment will be used in place of the pre-weighed sample collection sock over the end of the metal tube of a Nilfisk brand HEPA vacuum cleaner Model Number UZ 940

- Sample collection Vessel: Samples will be collected using unused and manufacture prepared 25-mm, three-piece cassette with ca. 50-mm electrically conductive extension cowl and cellulose ester filter, 0.45 µm pore size, and backup pad. (The electrically conductive extension cowl reduces electrostatic effects that may cause sample loss by dust particulates remaining on the side of the cassette).

- Vacuum Device: A standard industrial hygiene high volume sampling pump will be used to collect surface dust. The sample will be collected at a flow rate of 10 liters per minute.

- Equipment Set-Up and Use:
    - The cassette will be used closed face and will be connected to a sampling pump.
    - New Tygon tubing will be connected to the closed face to act as an intake nozzle.

- At the end of the tubing, a cassette without a filter will be used if necessary as a nozzle to be in contact with surfaces that are tested.
- At the end of sampling, the supplied end plugs will be replaced on the closed faced cassette.

Cassette for use as sample collection vessel

Sampling pump connected to cassette.

Cassette shown with clean intake tubing on closed face. A cassette without a filter will be connected to the tubing on the closed face side to act as a nozzle if necessary to facilitate collection.

Chain of Custody

NVL's Standard Chain of Custody Procedures include:

- All samples must have an unique field sample number that will identify it with a specific collection details (including location/date/time) that cannot be reused.
- Personnel will maintain control and security of samples collected to prevent loss or possible tampering.
- A chain of custody form will be used to transfer custody of samples to the laboratory.
- The chain of custody form minimally includes fields for sample number, parameter for analyses, sample collection date & time, sampler, and custody transfer signature area.
- Samples collected will be properly stored and relinquished to the laboratory for analysis as soon as practical.

Analysis

Wipe Samples for PCBs

- Samples will be submitted to AIHA and WA Dept. of Ecology accredited laboratories to be analyzed for PCB Arochlor content via EPA METHOD 8082A - POLYCHLORINATED BIPHENYLS (PCBs) BY GAS CHROMATOGRAPHY. The Method Reporting Limit will be established at 0.050ug/wipe per the House Dust Sample Collection and Assessment Sampling Plan requirement.

Wipe Samples for Metals

- Samples will be analyzed by NVL Labs. EPA Method 3051/6010C: Microwave Assisted Acid Digestion of Sediments, Sludges, Soils, and Oil. Samples are to be analyzed for metals previously determined to be present in abrasive blasting media; Chromium, Copper, Nickel and Zinc.

Vacuum Samples of Bulk Dust for PCB analysis

- Samples will be submitted to AIHA and WA Dept. of Ecology accredited laboratories to be analyzed for PCB Arochlor content via EPA METHOD 8082A - POLYCHLORINATED BIPHENYLS (PCBs) BY GAS CHROMATOGRAPHY. The Method Reporting Limit will be established at 0.11 ppm per the House Dust Sample Collection and Assessment Sampling Plan requirement.

Laboratory turnaround time will be standard, five business days, unless directed by EPA to commission more costly expedited analysis and results.

Quality Assurance / Quality Control (QA/QC):

Rainier Commons and NVL will adopt and comply with the Quality Assurance procedures documented for this specific issue and site in Quality Assurance Project Plan for Rainier Commons House Dust Sample Collection and Assessment, with minor exceptions noted below:

- EPA specific procedures and processes identified in the document will be modified to be Rainier Commons and NVL specific.
- Field Duplicate samples are to be gathered randomly for 10% of samples indicated in the “locations for testing” table above as required by the Quality Assurance Project Plan for Rainier Commons House Dust Sample Collection and Assessment. Duplicate sample locations will be chosen in the field based on the availability of duplicate sample locations/areas.
- Samples will not be analyzed at EPA’s Manchester Environmental Laboratory, rather will be analyzed at private laboratories complying with identified QA/QC procedures.
- Vacuum Dust Procedures will be modified as noted in Sampling Methodology section of this Dust Sample Collection and Assessment Plan.
- Sample collection procedures for the metals wipe samples will be performed in the same manner as the PCB wipe samples in the Quality Assurance Project Plan for Rainier Commons House Dust Sample Collection and Assessment with the exception of the sample media and sample area as noted in this document.

Data Interpretation / Action Levels

Data interpretation and Action Levels will comply with and duplicate those detailed in the Quality Assurance Project Plan for Rainier Commons House Dust Sample Collection and Assessment.

Additional direction from EPA. Action level for reporting will be 10 ug/wipe (for PCB dust wipe samples), wipes collected over 10 cm by 10 cm area.

Reporting

A written report will be provided by NVL to Rainier Commons to provide to the EPA within 30 days of completion of all laboratory analysis. The report will include a description of the sampling locations as well as site photos. The results of the laboratory analysis will be shown in a data table. Any sample with a detection result above an Action Level will be shown in bold in the table. Laboratory analysis reports and a site map showing sample collection locations will also be included as attachments to the report.